

F. Smith

1.

Howland Island
15-17 September 1966

We landed on Howland Island on the afternoon of the 15th of September. We set up camp in about one hour and then proceeded to take a quick look around the island before dark. There was a late stage breeding colony of Sooty Terns at the north end of the island and a lot of breeding activity among the Blue faced Boobies. The night of the 15th we did nothing but take blood samples from various birds around the island. The next morning we circled the island and banded immature Blue-faced Boobies while taking a nest count of this species. A shorebird count was taken by Walt Bulmer during the same period. The afternoon of the 16th we worked on individual projects. I collected a few lizards - mourning Gekkos & Snake-eyed Skunks. The night of the 16th we banded 2500 Sooty Tern Chicks in the breeding colony. The next day we worked on individual projects again. I collected 10 Sooty Terns for nasal mite studies and later Chris Thompson and I did a quick check on Sooty Tern Chicks to determine the degree of Tick infestation. The night of the 17th we banded 400 Adult Lesser Frigatebirds and collected vomit samples from these Frigates and a few Blue-faced Boobies. The next morning we left the island and this was my last stay on the rock for the first half of the cruise.

General Observations:

Sooty Tern

There was a late stage breeding colony at the north end of the island and a swirl at the southeast end that had not sat down yet. The breeding colony was generally in poor shape - collaborated by the fact that we found many dead chicks which had been banded on the previous cruise about 1 month earlier. The food supply was evidently short - the Terns were either abandoning their chicks or could not catch enough food to satisfy their needs. There were two distinct age groups of chicks found in the colony. One group about 2 months old - which had been banded heavily on the previous trip and another group about 1 month old which were still unhatched on the previous trip. The younger group of birds were definitely better fed and healthier than the

older group. The reasons for this are unknown unless the parents of the older group deserted at an earlier date because of a food deficiency in the area which had since been rectified. The availability of food for Sooty Terns could be correlated with the numbers of predator fish (Tuna, etc.) in the area - a population of the predator fish could vary considerably within a short period of time drastically effecting Tern breeding success.

The colony covered about ten acres and was located in areas of low vegetation - generally *Tribulus* sp. It was located toward the center of the island some several hundred yards from the nearest beach.

Mortality among Chicks appeared to be mostly because of starvation. I saw little evidence of extensive Cat activity in the area although they undoubtably took a few.

The colony, particularly the chicks were moderately to heavily infested with *Ornithodorus* (soft ticks). I examined 30 Chicks of which 27 were found positive for ticks (a 90% infestation rate). The number of ticks per bird varied with age. The younger group of chicks (1 month old) had the highest number per bird - averaging 20 to 30 per bird. The older chicks had less ticks averaging 5 to 10 per bird. Adults presumably would have even fewer for they were on the ground for a shorter period of time. The ticks were apparently very hungry for they ravenously attacked us every time we entered the area. The main concentration of ticks was definitely in the Tern colony for we were not bothered in other areas on the island.

The growth rate of the Tern chicks was very slow - apparently being effected by the food supply. The month + old chicks which were hatched during the last visit and banded were very underdeveloped for their age. If these were not known age chicks I would have guessed their age at about 21 days.

As for an estimate of numbers I would say about 60,000 total birds using the island - 40,000 Adults and 20,000 chicks. The number of Terns in the swirl over the breeding colony varied greatly with the time of day. There were fewer than 500 in the early morning hours but began to pick

up rapidly and by 1200 there were several thousand swirling around.

Paratatism: Numerous instances of Terns being chased by Lesser Frigates. Both male & female Frigates were participating. Peculiarly, few Frigates were seen directly over the colony however. They were intercepting the Terns just off shore on their way to the colony. No instances of Frigates taking Tern chicks were observed, probably because most of the chicks were at an advanced age. Many immature Terns were flying as a matter of fact.

Blue Faced Booby

The Blue faced boobies were breeding all around the outskirts of the island. There were heavy concentrations from the beach about 100 yards inland and a few scattered nests farther inland. The heaviest concentrations were at the northwest and southwest ends of the island. Breeding was observed in all stages from egg thru small freshly hatched chicks thru large downy chicks to flying immatures. Most of the nests had large chicks or immatures however. The nests of this species were simply scooped out areas of bare ground in regions of low vegetation - *Tribulus* sp.. Nests were observed with 1 and 2 eggs. We checked some adults for vomit at 1000 in the morning and found that they were empty. Apparently they had been on the nest for some period of time while their mates were out at sea procuring food. Late in the evening or early at night proved to be the best time to find adults with their catch. Estimated population of Adults on the island - 3000 with about 1500 breeding.

Brown Booby

There were 12 nests of this species found on the southwest corner of the island mixed with Blue faced Boobys. Two nests with 3 eggs were seen along with 5 nests with 2 eggs, and 3 nests with 1 egg. Also saw one large downy chick and one large local. The nests of this species were similar to Blue faced except they tended to have more nesting material piled around the sides (twigs etc.). Estimated population about 40 with 27 breeding.

Red footed Booby

Estimated population of 200 with moderate numbers roosting in high bushes near the Frigate colony at the south end of the island. Several subadults were seen but no nests were observed.

Lesser Frigatebird

A fairly large breeding colony of Lesser Frigates was located at the south center portion of the island. An estimated 6000 were breeding and had nests ranging from 1 egg to large chicks. Several nests with 2 eggs were observed. Most of the nests were located atop low vegetation with a few being found in high bushes. The colony covered approximately 8 acres of area. Numerous adults were seen during the day chasing Sooty Terns offshore - both males & females were seen, chasing in equal numbers. During the day a large swirl of approximately 2000 was seen stretching in an east-west direction over the island and extending out to sea about $\frac{1}{2}$ mile. Few were seen over the Sooty Tern colony at the north end of the island.

Greater Frigatebird

Estimated population of 50 on island - seen roosting along outskirts of Lesser Frigate colony and also in swirl of Lesser Frigates during day. A few subadults Great Frigates were also seen.

Common Noddy Terns

Estimated population of 30 seen scattered around island at various points.

Greybacked Tern

Estimated population of 25 seen at Northwest corner of island.

Redtailed Tropicbirds

Did not get a chance to examine these birds. However there are about 20 nests on island mostly at Northwest end in rocky area near beach. I did observe some adults over

The island during their display flight (nuptial)

Bristle-thighed Curlew.

Estimated population of 10 seen scattered around island in groups of as large as four.

Mammals

Observed serval cats at night but saw no signs of kills made by them anywhere on the island. Could not find any cat dens.

Possibly saw 1 mouse in sooty Tern colony - not a positive sighting though.

Reptiles:

Snake-eyed Skinks seen in abundance during daylight hours all around the island.

Mourning Gekkos seen mostly at night around rock walls and the lighthouse

F.N. 26164

Sula leucogaster (SKIN)

F.S.N. 129

Sand Island, Johnston Atoll, Pacific Ocean

16 July 1966

L. Testis 5x2mm ; R. Testis minute

Weight - 1111 gms ; fat moderate

Molt: Pr.LR - 11 $\frac{3}{4}$ in; rest in, new

All other flight feathers in, new

Color: bill bluish gray; iris light gray

legs & feet yellow

S. Age (Imm)

F.N. 26165

Phaethon rubricauda (SKIN)

F.SN - 130

Sand Island, Johnston Atoll; Pacific Ocean

17 July 1966

Ovary 14x12mm; large ovum 2mm

Weight - 518 gms ; fat moderate

Molt: none

Color: none

S.

F.N. 26166

Sula leucogaster (SKIN)

F.SN - 131

Sand Island, Johnston Atoll, Pacific Ocean

18 July 1966

L. Testis 10x5mm, dark

Weight - 936 gms ; fat light

Molt: Pr.R - 6 $\frac{2}{3}$, 10 missing ; Pr.L - no molt

R.R 5 $\frac{2}{3}$; R.L. - 3 $\frac{2}{3}$, 6 $\frac{1}{2}$

Color: base of bill (skin) blue; becoming yellowish toward tip ; feet yellowish blue

S.

FWS # 131-X3951

FWS # 131-X4072

F.N. 26167

FSN-132

Anous stolidus (SKIN)

Sand Island; Johnston Atoll, Pacific Ocean

18 July, 1966

brood patch bare; ovary 11x8mm; large ovum 2mm
weight - 138gms ; fat light

Molt: PrL.R. 1,2 old; 3-9 new; 10 $\frac{2}{3}$

Color: bill black; feet brownish black

S.

F.N. 26168

FSN-133

Sterna fuscata (SKIN)

Sand Island; Johnston Atoll; Pacific Ocean

18 July, 1966

ovary 7x5 mm
brood patch refathering; large ovum 1.5 mm

Weight - 178gms ; fat light

Molt: none

Color: bill, legs & feet black; iris dk. brown; gape flesh

S. B.

F.N. 26169

FSN-134

Frigata minor

Sand Island, Johnston Atoll, Pacific Ocean

18 July, 1966

Weight - 1137gms

Molt: Pr.L. - 4 $\frac{2}{3}$; 7 $\frac{2}{3}$; 8, 9, 10 new

Pr.R. - 1 $\frac{1}{3}$; 5 pin; 9 $\frac{1}{3}$; 10 new

A.L.R. - 6 new

Color: bill ashy; Gular pouch light
pinkish orange; feet gray

FWS # 743-13622

F.N. - 26170

F.S.N. - 135

FWS# 753-75479

Sterna fuscata (SKIN)

Sand Island, Johnston Atoll, Pacific Ocean

20 July 1966

brood patch refeathered; ovary 10x6 mm
ova minute

weight - 205 gms fat moderate

Molt: Pr.L - 9 missing, 10 peg Pr.R - 9 peg 10 $\frac{2}{3}$

R.L.R. - 6 pin light body molt

Color: bill black; iris dark brown; feet sooty

B.

F.N. - 26171

F.S.N. - 136

FWS# 743-73076

Sterna fuscata (SKIN)

Sand Island, Johnston Atoll, Pacific Ocean

23 July 1966

No brood patch; ovary 7x7 mm; ova minute

Weight - 184 gms fat light to moderate

Molt: none

Color: bill black; feet sooty

B.

F.N. - 26172

F.S.N. - 137

FWS# 743-73996

Sterna fuscata (SKIN)

Sand Island, Johnston Atoll, Pacific Ocean

24 July 1966

brood patch $\frac{1}{2}$ refeathered; ovary 11x7 mm
large ova 3 mm

weight - 160 gms fat light

Molt: none

Color: bill black; feet sooty

B.

F.N. 26173

F.S.N-138

FWS# 753-501851

Sterna fuscata (SKIN)

Sand Island, Johnston Atoll, Pacific Ocean

24 July, 1966

brood patch $\frac{1}{2}$ refeathered; L.Testis 4x2mm, dark

Weight - 198gms fat moderate to heavy

Molt: P.L.R. 1 peg, 2 $\frac{1}{3}$; RR. 6 missing

heavy head & neck molt

Color: bill black; feet sooty

B.

F.N. 26174

F.S.N-139

FWS# 535-12063

Puffinus pacificus (skelton)

Sand Island, Johnston Atoll, Pacific Ocean

30 July, 1966

brood patch bare

Weight - 315gms

Molt: none

Color: light phase

S. B.

F.N. 26175-

F.S.N-140

FWS# 753-11351

Sterna fuscata (SKIN)

Sand Island, Johnston Atoll, Pacific Ocean

2 August, 1966

brood patch refeathering ($\frac{1}{2}$) L.Testis 5x2mm

Weight - 195gms fat moderate

Molt: Pr.R. - 1in, new; 2peg; 3pin, restin, old Pr.L - 1in, new;
2peg; 3missing; restin, old: RectR. - 1missing; 2-5in;
6 $\frac{1}{3}$ RectL. - 1-5in; 6 $\frac{1}{3}$; light body molt

Color: bill legs & feet black; iris dark brown; gape flesh

S. B.

blue paint (serial bird)

F.N. - 26176

F.S.N- 141

FWS# 743-13959

Sterna fuscata (skin)

Sand Island, Johnston Atoll, Pacific Ocean

2 August, 1966

brood patch bare; L. Testis 6x3mm

Weight - 160 gms fat light

Molt: none

Color: bill, legs & feet black; iris dark brown; gape flesh

S. B.

F.N. 26177

F.S.N- 142

Sterna fuscata (skin)

Sand Island, Johnston Atoll, Pacific Ocean

4 August, 1966

No brood patch; ovary 6x6mm; ova minute

Weight - 200gms fat light

Molt: none

Color: bill, legs & feet black; iris dark brown; gape flesh

S. Blood not taken

F.N. 26178

F.S.N- 143

FWS# 743-13498

Sterna fuscata (skin)

Sand Island, Johnston Atoll, Pacific Ocean

7 August, 1966

No brood patch; ovary 10x5mm; large ova 1mm

Weight - 159gms fat light

Molt: none

Color: bill black; feet sooty; forehead & sides
of neck lightly speckled

S. Age - 3 yrs.

F.N. 26179

F.S.N - 144

Sterna fuscata (SKIN)

Sand Island, Johnston Atoll, Pacific O.

13 August 1966

No brood patch; ^{L. Testis 4x2 mm}
^{R. Testis minute}

Weight - 147 gms fat light
moderate body molt

Color: speckled neck, belly

S.

F.N. 26180

F.S.N - 145

Sterna fuscata

Sand Island, Johnston Atoll, Pacific O.

23 August 1966

Brood patch $\frac{1}{2}$ feathered ovary 10x8 mm
large ovum 1 mm.

Weight - 204 gms fat moderate

Molt: Pr. L.R - 1 pin, rest in; no other molt

Color: bill, legs & feet black; iris dark brown
gape flesh

S.

146 - 149 skipped

F.N. # 26180
F.S.N - 145
20 ¹/₁
843, 90 ¹/₁

F.N. 2418

Pterodroma externa externa (SKIN)

F.S.N. 150

$15^{\circ}19'N$ $172^{\circ}49'W$

11 Sept. 1966

No brood patch; Ovary 9x5mm; ova minute

Weight - 423gms ; fat light

Molt: Pr.L.R. - 1-8 in, new; $9\frac{2}{3}$ in; $10\frac{1}{3}$

Sec-all in, new RR - 1 in; $2\frac{2}{3}$, rest in

R.L. - 1 in; $2\frac{2}{3}$, rest in

Color: legs-prox $\frac{2}{3}$ pink foot-dist $\frac{1}{3}$ black
iris brown; gape flesh

E.S.

F.N. - 2490

Sterna fuscata (SKIN)

F.S.N. - 151

$00^{\circ}38'N$ $176^{\circ}34'W$

18 Sept 1966

Imm. Ovary 3x3mm ova minute

Weight - 159gms fat light

No molt

Color: iris dk brown; bill, feet &
legs black

E.S.

F.N. 2441

Puffinus tenuirostris (SKIN)

F.S.N. 152

Pacific Ocean 4 miles west of Baker Is.

18 Sept. 1966

No brood patch; Ovary 12x7mm; large ovum 2mm

Weight - 539gms fat heavy

No molt

Color: bill black; legs - inner portion flesh - outer black

Foot - upper black lower flesh; iris dark brown

S.

F.N. - 2444

Oceanodroma leucorhoa

F.S.N. - 153

00°39'N 176°21'W

19 Sept. 1966.

No brood patch; L. Testis 2x1mm; R. Testis 1x.5mm

Weight - 37gms.; fat light

Molt: Pr.L.R. 1-8in; 9 $\frac{1}{3}$; 10in Sec. R-all in

Sec L - 1-6in, 7 $\frac{1}{3}$, rest in R.R.L. - all in Nobody molt

Color: bill, legs & feet black; iris dark brown
S.

F.N. - 2445

Oceanodroma leucorhoa

F.S.N. - 154

01°03'N 175°24'W

20 Sept. 1966

No brood patch; Ovary 4x2mm; ovum minute

Weight - 40gms. fat light

Molt: Pr.L.R. - 1-7in, new; 8 $\frac{1}{3}$; 9-10in, old No other

Color: bill, legs & feet black; iris dark brown
S.

F.N. - 2451

Oceanodroma leucorhoa

F.S.N. - 155

00°52'N 176°34'W

20 Sept. 1966

No brood patch; Ovary 3x2mm; ovum minute

Weight - 38.7gms. fat light

Molt: Pr. L.R. 1-7in, new; 8 $\frac{1}{3}$; 9-10in, old.

Color: bill, legs & feet black; iris dark dark
S.

F. Smith

F.N. - 2448

F.S.N. - 156

Pterodroma leucoptera

00° 53' N 176° 21' W

20 Sept. 1966

No brood patch; gonads minute

Weight - 110gms fat light

Molt: Pr. L.R. all in, new; no other

Color: iris black; bill black; legs-prox 3/4
blue-gray, dist 1/4 + feet black

S.

F.N. 2456

F.S.N. - 157

Puffinus tenuirostris

00° 04' N 177° 04' W

22 Sept 1966

L. Testis 15x9mm (gray)
No brood patch; R. Testis 12x10mm (white)

Weight - 576gms extremely heavy fat

No molt

Color: Iris dark brown; bill dark gray
with black hook; feet & legs blackish
purple with black outsides

S.

F.N. - 6697

F.S.N. - 158

Sterna fuscata (nestling)

Howland Island

15 Sept. 1966

No brood patch L. Testis 2x1mm
R. Testis minute

Weight - 130gms fat light

Molt: Primaries & Sec. pin & peg

Color: bill, legs & feet black; iris dark brown

S.

F. Smith

F.N. - 6714

Arenaria interpres

F.S.N. - 159

Howland Island

20 Sept. 1966

L. testis 3x1mm

No brood patch; R. testis 1x1mm

Weight - 92.6gms fat moderate

Molt - none

Color: bill dark grayish black; legs & feet
orange; iris dark brown

S.

F.N. - 2468

Sterna fuscata

F.S.N. - 160

23 Sept. 1966

L. testis 5x3mm

brood patch refeathering; R. testis 3x3mm

Weight - 165gms fat light

Molt: P.L.R. - 1-7in, new; 8 $\frac{1}{3}$; 9in; 10in, old

R.L. - 1-4in; 5 $\frac{2}{3}$; 6in RR - 1-4in; 5in; 6in

light body molt

Color: iris brown; legs black bill black

S.

F.N. - 6725

Arenaria interpres

F.S.N. - 161

Enderbury Island

26 Sept. 1966

No brood patch; ^{ovary 8x4mm} lava minute

Weight: 75.7gms fat moderate

Molt: none

Color: bill black; legs orange; iris brown

S.

F. Smith

F.N. - 6728

Arenaria interpres

F.S.N. - 162

Enderbury Island

26 Sept. 1966

No brood patch; L. Testis 2x1mm
R. Testis 1x1mm

Weight - 102.8gms fat heavy

Molt: Pr. R.L. - 1 $\frac{1}{3}$, 2-6in, 7 $\frac{1}{2}$, 8-10in

Sec. R.L. - 1pin, rest in R.L. - 1-2in; 3 $\frac{1}{3}$ in, 4.5

RR - 1-2in, 3 $\frac{1}{3}$, 4-6in; moderate molt on
breast & back

S.

F.N. - 6732

Arenaria interpres

F.S.N. - 163

Enderbury Island

26 Sept. 1966

No brood patch L. Testis 2x1mm

Weight - 99.7gms fat moderate

Molt: Pr. L.R. - 1-6in, new; 7 $\frac{2}{3}$, 8pin; 9-10in, dd.

Sec. heavy molt; R.L. - 1pin, 2-4in, 5pin, 6in

RR - 1-3in, 9 peg; 5-6in

Color: bill black; iris dk brown; legs & feet orange

S.

F.N. - 6745

Sterna lunata

F.S.N. 164

Enderbury Island

26 Sept. 1966

L. Testis 9x4mm
brood patch bare; R. Testis 8x4mm

Weight - 125gms fat light

Molt: none

Color: bill, legs & feet black; iris dark brown;
gape flesh

S.

P. Smith

F.N. - 6746

F.S.N. - 165

Arenaria interpres

Enderbury Island

26 Sept. 1966

L. Testis 2x1mm
No brood patch; R. Testis .5x1mm

Weight - 111gms fat moderate

Molt: Pr. L.R. - 1-2 peg; 3 pin; rest in
R.L. - 1 in; 2 pin; rest in; RR - 1-2 in; 3 pin
light body molt

Color: bill black; iris dark brown;
legs & feet orange

S.

F.N. - 6750

F.S.N. - 166

Anous stolidus

Swains Island

5 Oct., 1966

L. Testis 6x3mm
No brood patch; R. Testis 5x3mm

Weight - 195gms fat light

Molt: Pr. L.R. - 1-9 in, new; 10 $\frac{2}{3}$
R.L - 1-2 in; 3 $\frac{2}{3}$; 4-5 in; 6 $\frac{2}{3}$ RR - 6 pin

Color: iris dark brown; bill, legs & feet black

S.

F.N. - 6763

F.S.N. - 167

Anous minutus

Birnie Island

11 Oct., 1966

L. Testis 2.5x1.5, dark
No brood patch; R. Testis 1x1 mm, dark

Weight - 115 fat mod. to heavy

Molt: Pr. L.R. - 1-6 in; 7 $\frac{1}{3}$; 8-10 in

R.L - 1 peg; 2-3 in; 4 $\frac{1}{3}$; 5 in; 6's

RR - 1-5 in; 6 $\frac{2}{3}$ heavy molt on neck

Color: iris dark brown; bill, legs & feet black

S.

F.N. - 2481

Sterna fuscata

F.S.N. - 168

30 miles SE of Baker Island

13 Oct., 1966

ovary 10 x 5 mm
No brood patch; large ovum 2 mm

Weight: 157 gms fat moderate

Molt: Pr. R. - 1-2 new; 3 $\frac{1}{3}$; 4 $\frac{4}{3}$; 5 = 10 in, old

Color: iris dark brown; bill, legs & feet black
S.

F.N. - 2483

Sterna fuscata

F.S.N. - 169

30 miles SE of Baker Island

13 Oct. 1966

No brood patch; L. Testis 2 x 1 mm

Weight: 162 gms fat moderate

in LR.
Molt: 1 new; 2 $\frac{2}{3}$; rest in, old

Color: iris dark brown; bill, legs &
feet black

S.

F.N. - 2486

Sterna fuscata

F.S.N. - 170

30 miles SE of Baker Island

13 Oct. 1966

No brood patch; L. Testis 3 x 1 mm

Weight: 210 gms fat moderate

Molt: Pr. L.R. - 1-8 in, new; 9 $\frac{1}{3}$; 10 in, old

R.R. - 1-3 in; 4 missing; 5-6 in

Color: iris dark brown; bill, legs & feet
black

S.

F.N. - 2487

F.S.N. - 171

Sterna fuscata

30 miles SE of Baker Island

14 Oct. 1966

No brood patch; ovary 7x6mm
ova minute

Weight: 150gms fat moderate

Molt: Pr.L. - 1-8in; 9 $\frac{2}{3}$; 10 missing

R.L. - 1 $\frac{1}{2}$; 2 $\frac{1}{2}$; 3-6in RR - all in

Color: iris dark brown; bill, legs & feet
black

S.

F.N. - 2493

F.S.N. - 172

Pterodroma leucoptera

0°26'S 178°40'W

15 Oct. 1966

No brood patch; ovary 9x3mm
ova minute

Weight - 119gms fat light

Molt: RR. - 1 $\frac{2}{3}$; 2-3in; 4pin; 5-6in

R.L. - 1 $\frac{2}{3}$; 2-3in; 4pin; 5in; 6 missing

S.

F.N. - 2499

F.S.N. - 173

Oceanodroma leucorhoa

0°45'S 178°06'W

15 Oct. 1966

No brood patch; ovary 3x3mm
ova minute

Weight: 40gms fat light

Molt: 1-7in, new; 8 $\frac{2}{3}$; 9 missing; 10in, old

Color: iris dark brown; bill, legs
& feet black

S.

F. Smith

F.N. - 6772

F.S.N. - 174

Anous stolidus (chick)

Baker Island

14 Oct. 1966

ovary 3x1mm ova minute

weight: 27.8gms fat light

No feathers developed

Color: iris dark brown; bill, legs &
feet black

F.N. - 2982

F.S.N. - 175

Oceanodroma leucorhoa

30 miles SE of Baker Island

13 Oct. 1966

No brood patch; gonads destroyed

weight - 42gms fat light

Molt: Pr. UR - 1-7in, new; 8 $\frac{1}{2}$; 9in; 10in

Color: iris dark brown; bill, legs &
feet black